



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR850P
(3.80 GHz, Intel Xeon Gold 5222)

SPECrate®2017_int_base = 137

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017

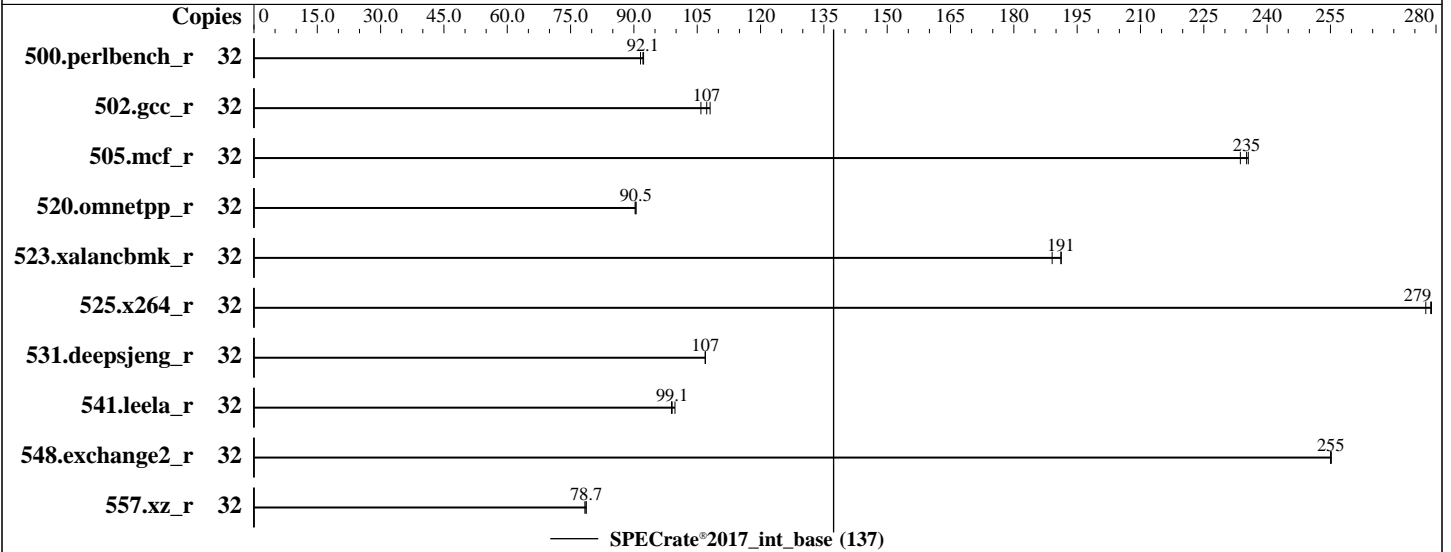
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Nov-2020

Hardware Availability: Jun-2020

Software Availability: Aug-2020



Hardware

CPU Name: Intel Xeon Gold 5222
 Max MHz: 3900
 Nominal: 3800
 Enabled: 16 cores, 4 chips, 2 threads/core
 Orderable: 4 chips
 Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 16.5 MB I+D on chip per chip
 Other: None
 Memory: 1536 GB (48 x 32 GB 2Rx4 PC4-2933Y-R)
 Storage: 1 x 960 GB SATA SSD
 Other: None

Software

OS: Red Hat Enterprise Linux 8.0 (Ootpa)
 Kernel 4.18.0-80.el8.x86_64
 Compiler: C/C++: Version 19.1.2.275 of Intel C/C++ Compiler for Linux;
 Fortran: Version 19.1.2.275 of Intel Fortran Compiler for Linux
 Parallel: No
 Firmware: Lenovo BIOS Version TEE156L 2.61 released May-2020
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 Other: None
 Power Management: BIOS set to prefer performance at the cost of additional power usage



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR850P
(3.80 GHz, Intel Xeon Gold 5222)

SPECrate®2017_int_base = 137

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Nov-2020
Hardware Availability: Jun-2020
Software Availability: Aug-2020

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	32	556	91.6	553	92.1	552	92.3							
502.gcc_r	32	428	106	422	107	419	108							
505.mcf_r	32	221	234	220	236	220	235							
520.omnetpp_r	32	464	90.5	465	90.3	464	90.5							
523.xalancbmk_r	32	177	191	177	191	179	189							
525.x264_r	32	202	278	201	279	201	279							
531.deepsjeng_r	32	343	107	343	107	343	107							
541.leela_r	32	531	99.7	536	98.9	535	99.1							
548.exchange2_r	32	329	255	329	255	329	255							
557.xz_r	32	441	78.4	439	78.7	439	78.7							

SPECrate®2017_int_base = 137

SPECrate®2017_int_peak = Not Run

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
"/home/cpu2017-1.1.0-ic19.ltu2/lib/intel64:/home/cpu2017-1.1.0-ic19.ltu2/1
ib/ia32:/home/cpu2017-1.1.0-ic19.ltu2/je5.0.1-32"
MALLOC_CONF = "retain:true"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3> /proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:

(Continued on next page)



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_int_base = 137

ThinkSystem SR850P
(3.80 GHz, Intel Xeon Gold 5222)

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017

Test Date: Nov-2020

Test Sponsor: Lenovo Global Technology

Hardware Availability: Jun-2020

Tested by: Lenovo Global Technology

Software Availability: Aug-2020

General Notes (Continued)

```
numactl --interleave=all runcpu <etc>
```

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

Platform Notes

BIOS configuration:

Choose Operating Mode set to Maximum Performance and then set it to Custom Mode

MONITOR/MWAIT set to Enable

CPU P-state Control set to Legacy

Adjacent Cache Prefetch set to Disable

DCU Streamer Prefetcher set to Disable

SNC set to Enable

```
sysinfo program /home/cpu2017-1.1.0-ic19.lu2/bin/sysinfo  
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011  
running on localhost.localdomain Mon Nov 30 23:05:07 2020
```

SUT (System Under Test) info as seen by some common utilities.

For more information on this section, see

<https://www.spec.org/cpu2017/Docs/config.html#sysinfo>

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) Gold 5222 CPU @ 3.80GHz  
4 "physical id"s (chips)  
32 "processors"
```

cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)

```
cpu cores : 4  
siblings : 8  
physical 0: cores 2 5 9 13  
physical 1: cores 2 4 5 9  
physical 2: cores 1 2 5 13  
physical 3: cores 1 2 5 13
```

From lscpu:

```
Architecture: x86_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 32  
On-line CPU(s) list: 0-31  
Thread(s) per core: 2
```

(Continued on next page)



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_int_base = 137

ThinkSystem SR850P
(3.80 GHz, Intel Xeon Gold 5222)

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017

Test Date: Nov-2020

Test Sponsor: Lenovo Global Technology

Hardware Availability: Jun-2020

Tested by: Lenovo Global Technology

Software Availability: Aug-2020

Platform Notes (Continued)

```

Core(s) per socket: 4
Socket(s): 4
NUMA node(s): 8
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5222 CPU @ 3.80GHz
Stepping: 7
CPU MHz: 3438.826
CPU max MHz: 3900.0000
CPU min MHz: 1200.0000
BogoMIPS: 7600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 16896K
NUMA node0 CPU(s): 0,2,16,18
NUMA node1 CPU(s): 1,3,17,19
NUMA node2 CPU(s): 4,7,20,23
NUMA node3 CPU(s): 5,6,21,22
NUMA node4 CPU(s): 8,9,24,25
NUMA node5 CPU(s): 10,11,26,27
NUMA node6 CPU(s): 12,13,28,29
NUMA node7 CPU(s): 14,15,30,31
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx fl6c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3
invpcid_single intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi
flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
cqm_mbm_local dtherm ida arat pln pts pku ospke avx512_vnni flush_l1d
arch_capabilities

```

```

/proc/cpuinfo cache data
cache size : 16896 KB

```

```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 8 nodes (0-7)
node 0 cpus: 0 2 16 18
node 0 size: 193152 MB
node 0 free: 192967 MB

```

(Continued on next page)



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR850P
(3.80 GHz, Intel Xeon Gold 5222)

SPECrate®2017_int_base = 137

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Nov-2020

Hardware Availability: Jun-2020

Software Availability: Aug-2020

Platform Notes (Continued)

```

node 1 cpus: 1 3 17 19
node 1 size: 193534 MB
node 1 free: 193398 MB
node 2 cpus: 4 7 20 23
node 2 size: 193510 MB
node 2 free: 193312 MB
node 3 cpus: 5 6 21 22
node 3 size: 193534 MB
node 3 free: 193126 MB
node 4 cpus: 8 9 24 25
node 4 size: 193534 MB
node 4 free: 193396 MB
node 5 cpus: 10 11 26 27
node 5 size: 193534 MB
node 5 free: 193356 MB
node 6 cpus: 12 13 28 29
node 6 size: 193534 MB
node 6 free: 193401 MB
node 7 cpus: 14 15 30 31
node 7 size: 193534 MB
node 7 free: 193324 MB
node distances:
node  0  1  2  3  4  5  6  7
 0:  10 11 21 21 21 21 31 31
 1:  11 10 21 21 21 21 31 31
 2:  21 21 10 11 31 31 21 21
 3:  21 21 11 10 31 31 21 21
 4:  21 21 31 31 10 11 21 21
 5:  21 21 31 31 11 10 21 21
 6:  31 31 21 21 21 21 10 11
 7:  31 31 21 21 21 21 11 10

```

From /proc/meminfo

```

MemTotal:      1585019804 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

From /etc/*release* /etc/*version*

```

os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.0 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.0"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.0 (Ootpa)"
ANSI_COLOR="0;31"

```

(Continued on next page)



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_int_base = 137

ThinkSystem SR850P
(3.80 GHz, Intel Xeon Gold 5222)

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017

Test Date: Nov-2020

Test Sponsor: Lenovo Global Technology

Hardware Availability: Jun-2020

Tested by: Lenovo Global Technology

Software Availability: Aug-2020

Platform Notes (Continued)

```
redhat-release: Red Hat Enterprise Linux release 8.0 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.0 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.0:ga
```

uname -a:

```
Linux localhost.localdomain 4.18.0-80.el8.x86_64 #1 SMP Wed Mar 13 12:02:46 UTC 2019
x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

```
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: No status reported
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled
via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional,
RSB filling
```

run-level 3 Nov 30 23:02

SPEC is set to: /home/cpu2017-1.1.0-ic19.lu2

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 839G 65G 774G 8% /home
```

From /sys/devices/virtual/dmi/id

```
BIOS: Lenovo -[TEE156L-2.61]- 05/20/2020
Vendor: Lenovo
Product: ThinkSystem SR850P -[7D2HCTO1WW]-
Product Family: ThinkSystem
Serial: 1234567890
```

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

Memory:

```
48x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933
```

(End of data from sysinfo program)

Compiler Version Notes

```
=====
C      | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
      | 525.x264_r(base) 557.xz_r(base)
```

(Continued on next page)



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_int_base = 137

ThinkSystem SR850P
(3.80 GHz, Intel Xeon Gold 5222)

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Nov-2020
Hardware Availability: Jun-2020
Software Availability: Aug-2020

Compiler Version Notes (Continued)

Intel(R) C Compiler for applications running on Intel(R) 64, Version
19.1.2.275 Build 20200604
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

=====
C++ | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
541.leela_r(base)

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version
19.1.2.275 Build 20200604
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

=====
Fortran | 548.exchange2_r(base)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.1.2.275 Build 20200623
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64

(Continued on next page)



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_int_base = 137

ThinkSystem SR850P
(3.80 GHz, Intel Xeon Gold 5222)

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9017

Test Date: Nov-2020

Test Sponsor: Lenovo Global Technology

Hardware Availability: Jun-2020

Tested by: Lenovo Global Technology

Software Availability: Aug-2020

Base Portability Flags (Continued)

```
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64
```

Base Optimization Flags

C benchmarks:

```
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.3.275/linux/compiler/lib/intel64_lin
-lqkmallo
```

C++ benchmarks:

```
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.3.275/linux/compiler/lib/intel64_lin
-lqkmallo
```

Fortran benchmarks:

```
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.3.275/linux/compiler/lib/intel64_lin
-lqkmallo
```

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64_revA.html

<http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-I.html>

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64_revA.xml

<http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-I.xml>

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.0 on 2020-11-30 10:05:06-0500.

Report generated on 2021-01-05 14:44:01 by CPU2017 PDF formatter v6255.

Originally published on 2021-01-05.